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BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

FOREST INSECT INVESTIGATIONS

Project h-1-6

REPORT OF PINE BEETLE SURVEYS ON THE COLVILLE NATIONAL FOREST, WASHINGTON SUMMERS OF 1940 AND 1941

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REPORT OF PINE BEETLE SURVEYS ON THE COLVILLE NATIONAL FOREST, WASHINGTON SUMMERS OF 1940 AND 1941

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INTRODUCTION

The tenth and eleventh pine beetle surveys in portions of the ponderosa pine stands of the Colville National Forest, Washington, were completed during the periods of September 4-11, 1940, and October 22-23, 1941, respectively. These surveys, part of a regional cooperative project between the Forest Service, Indian Service, and Bureau of Entomology and Plant Quarantine, have the three following objectives: (1) To follow the infestation trends of forest insects, particularly those of the western pine beetle (Dendroctonus brevicomis Lec.); (2) to locate areas of epidemic infestation warranting direct control measures; and (3) to define the types of trees and areas most susceptible to insect attack which should be considered in forest management plans.

Two types of surveys were conducted. Intensive surveys were made on two 320-acre check plots (see table I) by three-man crews composed of the following personnel:

1940 crew - R. M. Ramstad, J. E. Weaver, and G. G. Black

1941 crew - F. E. Kimmey, G. W. Summerside, and H. A. Dahl

The former crew received detailed survey instructions at a ten-day training school held at Camp Sherman, Oregon, for the personnel of the Forest Service and Bureau crews. The 1941 crew was instructed in the field by Mr. A. J. Jaenicke of the Forest Service. Extensive or observational surveys over most of the 298,000 acres of commercial ponderosa pine of this forest were made by the writer during the period of September 4-5, 1940, but were not made in 1941. From these two surveys, estimates of the insect-caused ponderosa pine depletion for the forest as a whole were made.

RESULTS OF THE 1941 SURVEY

A summary of the 1941 check plot cruising data will be found in table II. This survey was made at a time when approximately 76 percent (Grant's curve) of the probable losses for the year were marked by the crew. Ponderosa pine losses on the two plots showed a decided decrease in 1941. Estimated volume losses for the year show a ratio of .63 to those of 1940, with approximately a 50 percent reduction in the number of trees killed in 1941. Practically all of these losses are attributable to the western pine beetle, with a small percentage of the total loss credited to the mountain pine beetle (Dendroctonus monticolae Hopk.) and to the California pine flathead (Melanophila californica VD). No direct control measures have been undertaken on the Colville National Forest and none are necessary at this time.

RECENT LOSSES

Two previous reports by the writer, bearing the same titles as the present report but dated October 1938 and March 1940, summarize the loss data for this forest prior to 1938. Table III presents a summary of ponderosa pine losses on the two plots for the three-year period 1938-1940 inclusive. During this period an average of 49 board feet per acre per year and .60 percent of the stand per year have been killed on the two check plots. This rate is indicative of a light epidemic infestation, which, for the most part, has probably been offset by annual growth.

GENERAL FOREST CONDITIONS

As a result of the two types of surveys, estimates of ponderosa pine depletion for the Colville National Forest and the stands of other ownerships immediately adjacent to the forest have been prepared. These estimates for 1939 and 1940 are given in table IV and the general condition in 1940 is shown by figure I. While these surveys uncovered no portions of the Colville National Forest needing immediate protection from forest insect depredations, consideration should constantly be given to the removal of as much susceptible timber as possible in present or in contemplated timber sales. By so doing, the stands are left in a more vigorous growing condition and the values in the over-mature timber crop are utilized before they are wasted by insect attacks. The Forest Insect Laboratory at Portland, Oregon offers cooperative assistance in determining the types of trees and the areas needing primary attention from a timber salvage or sanitation standpoint.

RECOMMENDATIONS

Because the data secured on the check plots become increasingly valuable with each year's survey, it is recommended that the check plots be covered again in 1942 and that another observational survey be made over the forest as a whole. The removal or salvage of the high value trees before they are attacked by insects should be carried out on all present and future timber sales.

SUMMARY

A brief review of pine beetle surveys during the summers of 1940 and 1941 in the ponderosa pine stands within and adjacent to the Colville National Forest, Washington, is presented.

Nearly all of the ponderosa pine insect-caused mortality on this forest is the result of attacks by the western pine beetle. The losses have been continuous but during the past few years have not been serious.

Since the low in 1937, the losses on the two check plots have increased and decreased on alternate years.

The estimated losses for 1941 are about half those of 1940.

No direct control work has been recommended.

Table I. Description of the survey check plots, Colville National Forest, Washington

Infestation area	Check plots: Name	Location: T.	R.	Sec.	Elev. (feet)	Type	Site quality	Ponderosa pine: Acres: Total	Pine timbered	Volume (board feet): As of Jan. 1, 1940	Per acre
Colville	Lost Creek	35N	30E	26SE/4 35NE/4	3,000-3,300	20 (20.5)	IV	320	320	2,740,000	8,600
	Growden	36N	36E	29N/2	2,500-3,000	20 (20.5)	IV	320	270	2,040,000	7,500

Table II. Summary of ponderosa pine check plot losses, Colville National Forest, Washington (Summer survey of 1941)

Check plot	1940 losses: Trees: First cruise	Total	Volume (bd.ft.)	Date of cruise	1941 losses: Partial losses: Trees	Volume (bd.ft.)	Predicted total losses: Trees	Volume (bd.ft.)	Per acre	% of stand	Ratio to 1940
Lost Creek	12	32	28,770	10/23/41	12	12,540	16	16,000	50	.58	.56
Growden	5	12	8,220	10/22/41	4	5,730	5	7,500	28	.37	.91
Total	17	44	36,990		16	18,270	21	23,500	40	.49	.63

Table III. Summary of recent ponderosa pine check plot losses
Colville National Forest, Washington

Check plot	1938 losses					1939 losses					1940 losses				
		Volume (board feet)					Volume (board feet)					Volume (board feet)			
	Trees	Total	Per acre	% of stand	Ratio to 1937	Trees	Total	Per acre	% of stand	Ratio to 1938	Trees	Total	Per acre	% of stand	Ratio to 1939
Lost Creek	20	24,330	76	.88	2.13	18	14,870	46	.54	.61	32	28,770	90	1.05	1.94
Growden	8	7,010	26	.34	1.15	3	3,750	14	.18	.54	12	8,220	30	.40	2.19
Total	28	31,340	49	.65	1.79	21	18,620	29	.39	.59	44	36,990	63	.77	1.98

Table IV. Estimated 1939 and 1940 ponderosa pine insect-caused depletion
Colville National Forest, Washington

Infestation area	Ponderosa pine		1939 losses				1940 losses			
	Acres	Volume (M.bd.ft.)	Trees	Volume M.bd.ft.	Per acre	% of stand	Trees	Volume Mbd.ft.	Per acre	% of stand
Colville N.F.	298,000	1,001,000	4,000	3,200	11	.32	6,000	5,500	19	.55

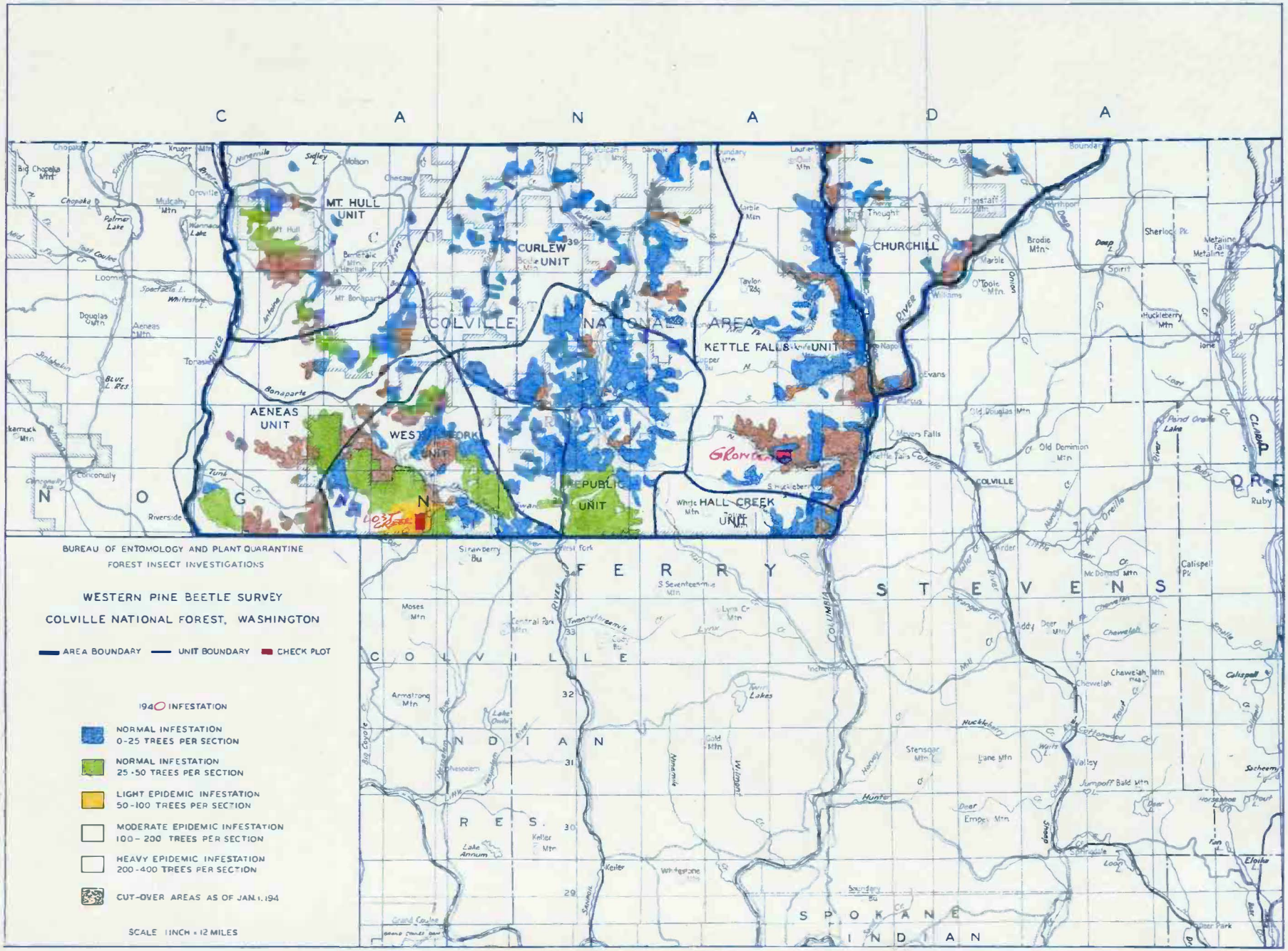
C A N A D A
MT. HULL UNIT
CURLEW UNIT
COLVILLE NATIONAL FOREST
KETTLE FALLS UNIT
CHURCHILL
AENEAS UNIT
WEST [illegible] UNIT
REPUBLIC UNIT
HALL CREEK UNIT
Grouse Creek
Lost Creek
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
FOREST INSECT INVESTIGATIONS
WESTERN PINE BEETLE SURVEY
COLVILLE NATIONAL FOREST, WASHINGTON
AREA BOUNDARY
UNIT BOUNDARY
CHECK PLOT
1940 INFESTATION
NORMAL INFESTATION 0-25 TREES PER SECTION
NORMAL INFESTATION 25-50 TREES PER SECTION
LIGHT EPIDEMIC INFESTATION 50-100 TREES PER SECTION
MODERATE EPIDEMIC INFESTATION 100-200 TREES PER SECTION
HEAVY EPIDEMIC INFESTATION 200-400 TREES PER SECTION
CUT-OVER AREAS AS OF JAN. 1, 194
SCALE 1 INCH = 12 MILES
FERRY
STEVENS
COLVILLE INDIAN RES.
SPOKANE INDIAN

FIGURE I.